

CLAIMS

What is claimed is:

1. An apparatus for polishing a surface of a workpiece, the surface including a low dielectric material, comprising:
 - a platen configured to orbit about an axis at a speed up to about 2000 revolutions per minute;
 - a polishing surface attached to the platen; and
 - a workpiece carrier proximate the polishing surface.
2. The apparatus of claim 1, wherein the platen is configured to rotate at about 1000 orbits per minute.
3. The apparatus of claim 1, wherein the platen is further configured to dither.
4. The apparatus of claim 1, wherein the platen rotates with an orbital radius of about 0.25 to about 1 inch.
5. The apparatus of claim 1, wherein the carrier and the platen are configured to move the workpiece relative to the polishing surface at a speed of about 0.8 to about 3.2 meters per second.
6. The apparatus of claim 1, wherein the carrier is configured to apply about 0.25 to about 2 pounds per square inch pressure to the workpiece in the direction of the polishing surface.
7. The apparatus of claim 1, wherein the platen includes channels configured to allow polishing solution to circulate through a portion of the platen.

8. The apparatus of claim 7, wherein the platen is configured to allow the polishing slurry to flow at a rate of about 120 to about 200 milliliters per minute.

9. The apparatus of claim 1, wherein the platen is configured to orbit at a speed of about 500 to about 2000 orbits per minute.

10. The apparatus of claim 1, wherein the carrier includes a bladder to regulate pressure applied to the workpiece.

11. The apparatus of claim 1, wherein the platen includes a conduit configured to allow heat exchange fluid to flow through a portion of the platen.

12. A polishing system for removing material from a wafer surface, the wafer including low-k material, comprising:

a plurality of polishing stations, wherein at least one of said plurality of polishing stations includes a platen configured to move at about 0.8 to about 3.2 meters per second relative to the wafer surface;

a clean system including at least one clean station; and
a load station.

13. The polishing system of claim 12, further comprising a buff station.

14. The polishing system of claim 12, further comprising a carousel carrier apparatus including a plurality of workpiece carriers.

15. The polishing system of claim 14, wherein the plurality of workpiece carriers are configured to rotate about an axis and translate in a radial direction.

16. The polishing system of claim 14, wherein at least one of said plurality of workpiece carriers is configured to apply a about 0.25 to about 2 pounds per square inch to the workpiece in the direction of the platen.

17. The polishing system of claim 12, further comprising a workpiece carrier configured to rotate about an axis and apply about 0.25 to about 2 pounds per square inch to the workpiece in the direction of the platen.

18. The polishing system of claim 12, wherein the platen is configured to orbit.

19. The polishing system of claim 18, wherein the platen is configured to orbit with a radius of about 0.25 to about 1 inch.

20. The polishing system of claim 12, wherein the platen is configured to orbit about an axis at a speed of about 500 to about 2000 orbits per minute.

21. The polishing system of claim 12, further comprising a temperature control system configured to regulate a temperature of a polishing fluid.

22. The polishing system of claim 12, wherein the platen includes channels to allow polishing fluid to flow through a portion of the platen.

23. The polishing system of claim 12, wherein the platen includes a groove configured to allow heat exchange fluid to flow through a portion of the platen.

24. The polishing system of claim 12, further comprising a polishing surface attached to the platen, the polishing surface including apertures to allow polishing fluid to circulate through a portion of the polishing surface.

25. A polishing system for removing conductive material deposited onto low-k material, comprising:

a load and unload station;

a plurality of polishing stations, wherein at least one polishing station includes a platen configured to move relative to a workpiece surface at about 0.8 to about 3.2 meters per second and a workpiece carrier configured to apply about 0.25 to about 2 psi to a workpiece in the direction of the platen; and

a clean system proximate the plurality of polishing station.

26. A method for removing material from a surface of a workpiece, including low-k material, comprising the steps of:

providing a workpiece;

placing the workpiece in contact with a polishing surface; and

orbiting the polishing surface at a speed about 500 to about orbits per minute.

27. The method of claim 26, further comprising the step of rotating the wafer.

28. The method of claim 26, further comprising the step of applying about 0.25 to about 2 pounds per square inch to the workpiece in the direction of the polishing surface.

29. The method of claim 26, further comprising the step of circulating polishing fluid through a portion of the platen.

30. The method of claim 26, further comprising the step of regulating the temperature of the polishing surface.

31. The method of claim 26, further comprising the step of regulating the temperature of a polishing fluid.

32. An apparatus for polishing a surface of a workpiece, the surface including a low dielectric material, comprising:

a platen configured to move about an axis;

a polishing surface attached to the platen; and

a workpiece carrier proximate the polishing surface, wherein the platen and the workpiece carrier are configured such that the surface of the workpiece and the platen move at a relative speed of about 0.8 to about 3.2 meters per second.

33. A method for removing material from a surface of a workpiece, including low-k material, comprising the steps of:

providing a workpiece;

placing the workpiece in contact with a polishing surface; and

moving the polishing surface and the workpiece relative to each other at a speed of about 0.8 to about 3.2 meters per second.